



2019 National Sunflower Production Survey Diseases – *Phomopsis stem canker*

Febina Mathew and Tom Gulya (Retired)

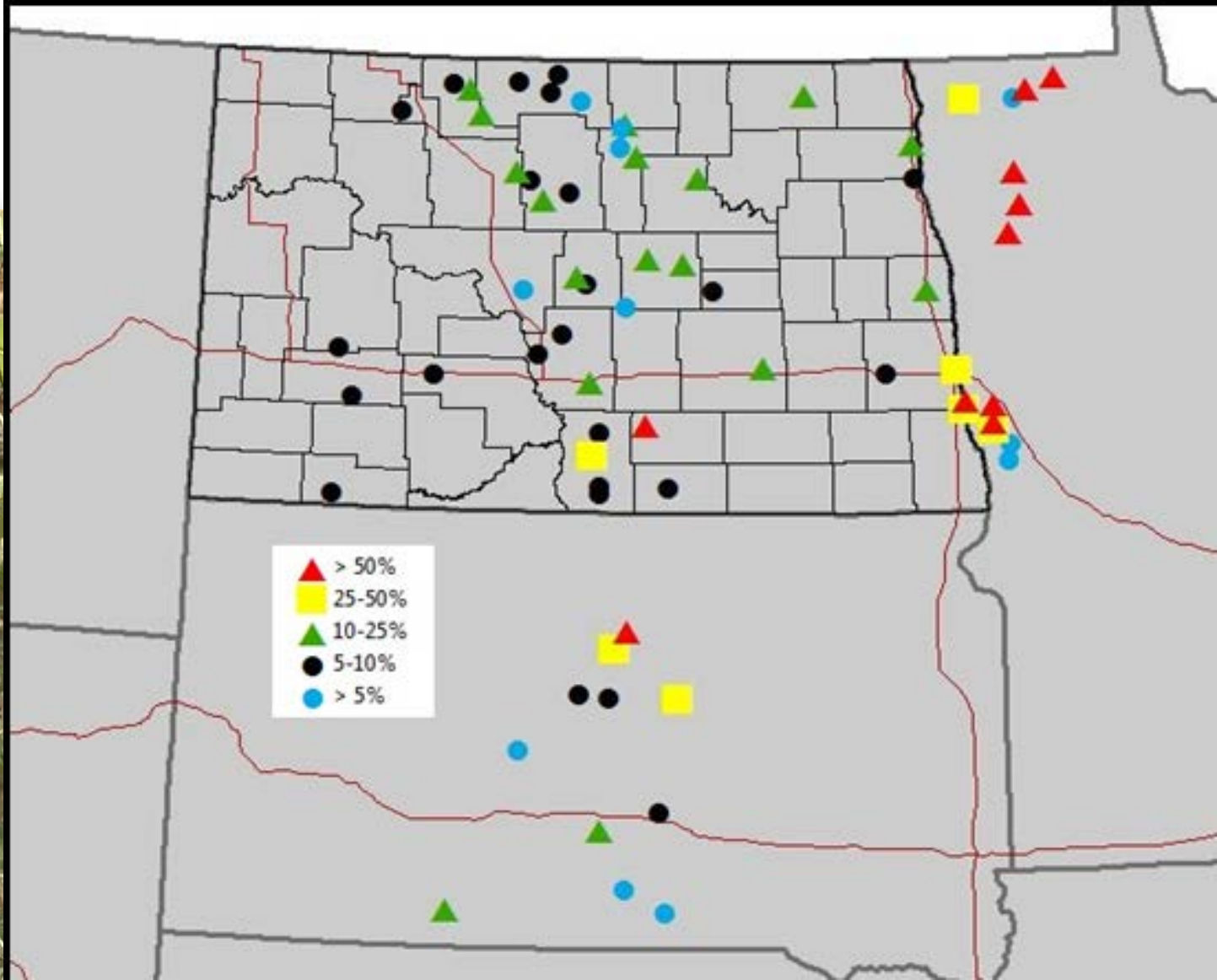
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²USDA-ARS, Edward T. Schafer Agricultural Research Center, Fargo, ND



**SOUTH DAKOTA
STATE UNIVERSITY**
College of Agriculture, Food
and Environmental Sciences

2010



Phomopsis stem canker on sunflower



R1 = bud initiation stage



R5 = flowering stage

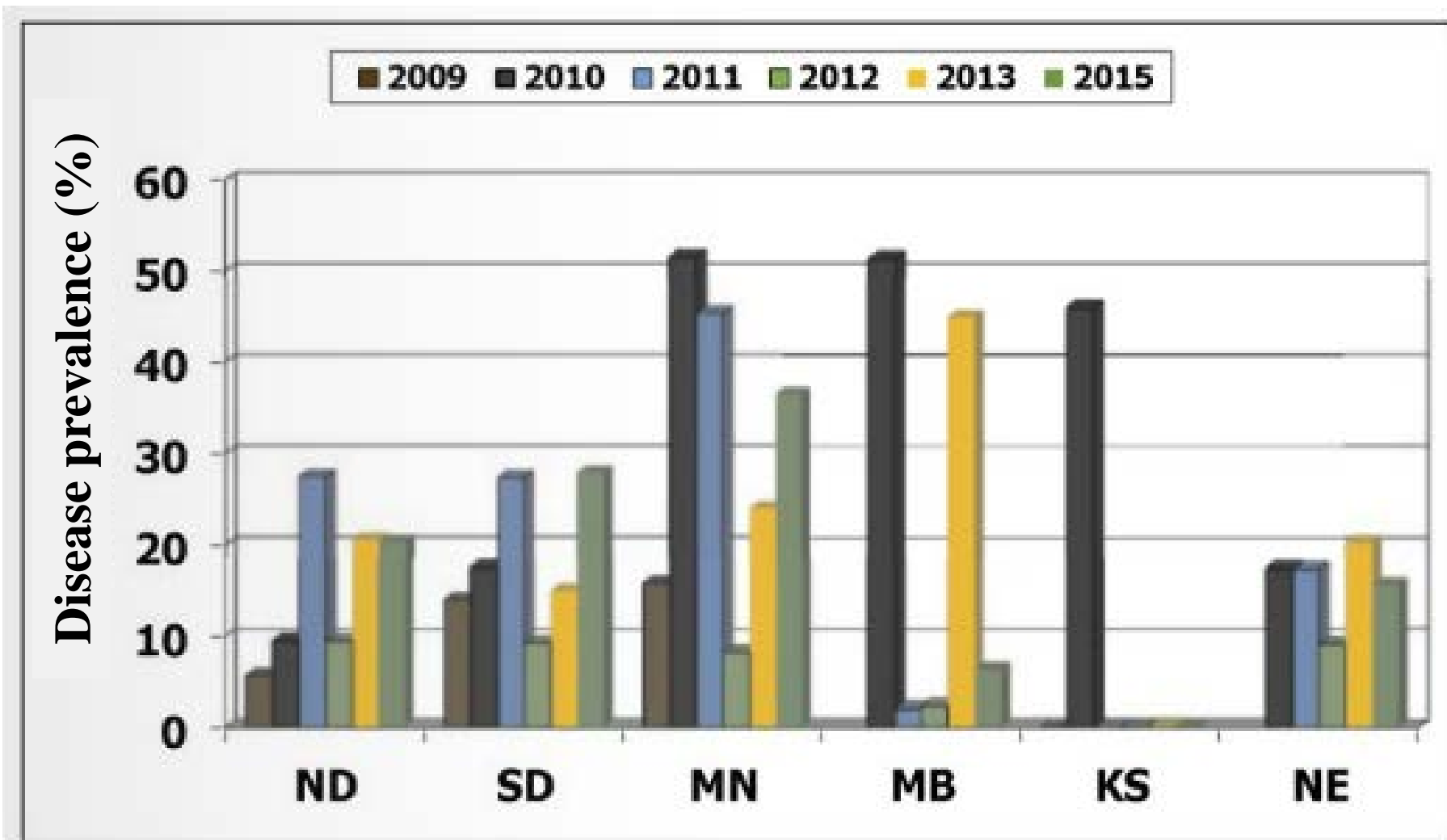


2010

- Two species identified - *Phomopsis helianthi* and *P. gulyae* (Mathew et al. 2015).
 - *Phomopsis helianthi* – MN, ND and SD
 - *Phomopsis gulyae* – Only in SD



2015



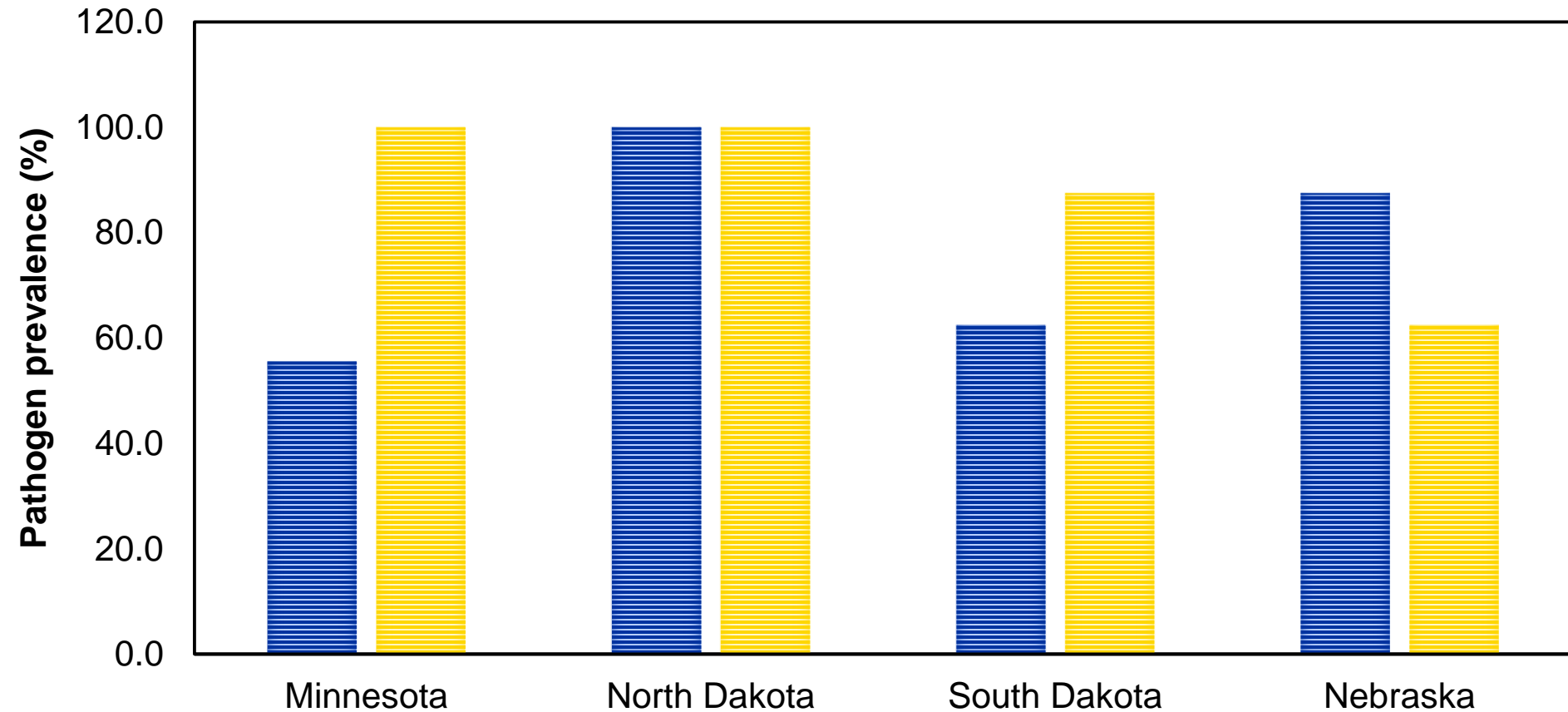
2016

- A third species identified - *Phomopsis stewartii* (Olson et al. 2017)
 - *Phomopsis stewartii*– MN



2017

■ *D. gulyae* ■ *D. helianthi*



Gulya and Mathew 2018



2019

- As of September, 20 species of *Phomopsis* reported worldwide (Olson et al. 2019)

- *Phomopsis longicolla* identified in ND and SD (N. Dungal et al. unpublished)



2019

- National Sunflower Production Survey funded by NSA to determine prevalence of species of *Phomopsis*

- DNA-based assays (Olson et al. 2019) was done by Mathew's lab (Brian Kontz)



2019

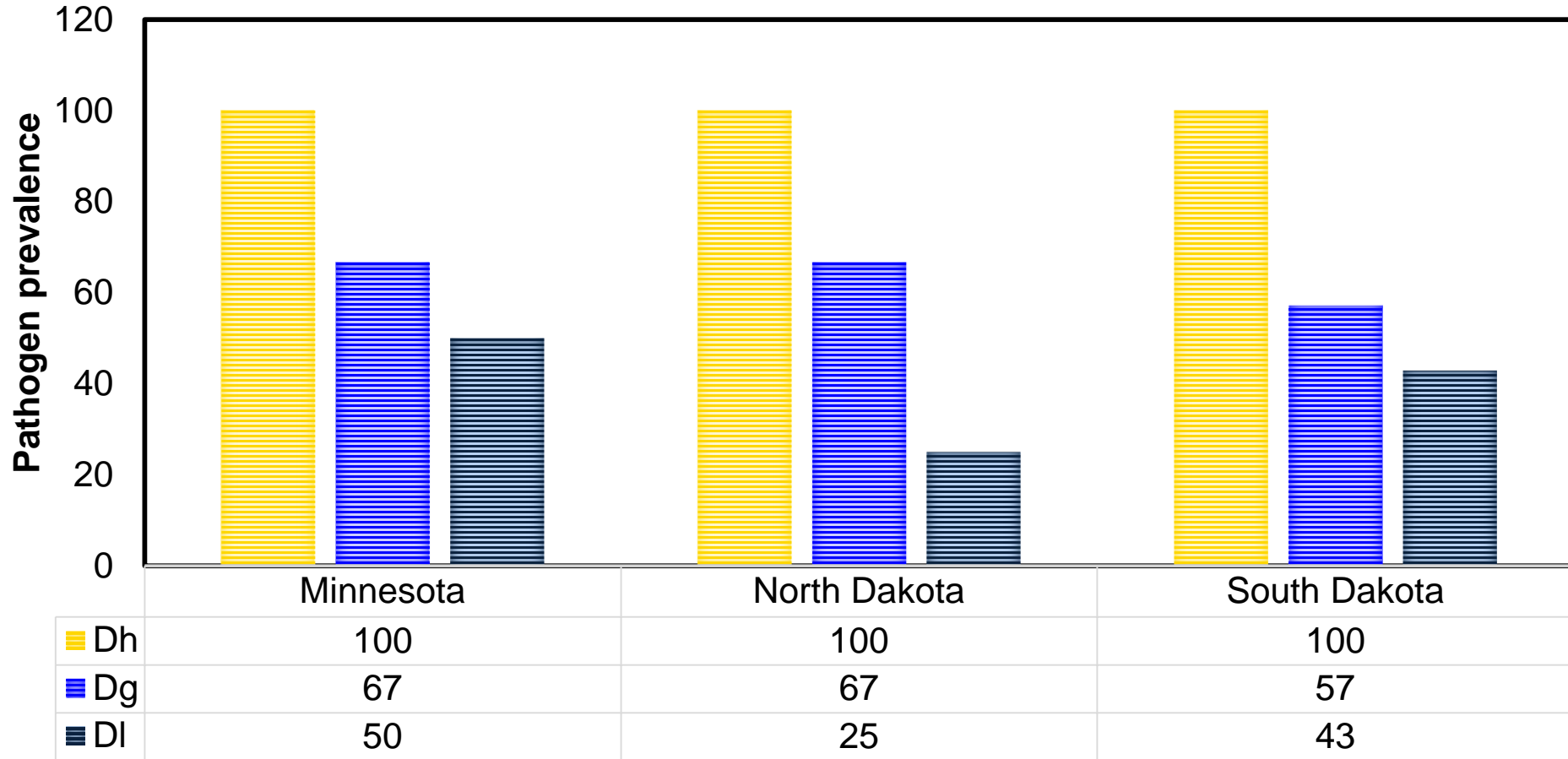
- A total of 135 stalks from 31 fields (5 to 6 stalks per field) received

- ✓ NSA surveyors
- ✓ Extension agents
- ✓ Farmers

6 counties in MN
12 counties in ND
7 counties in SD



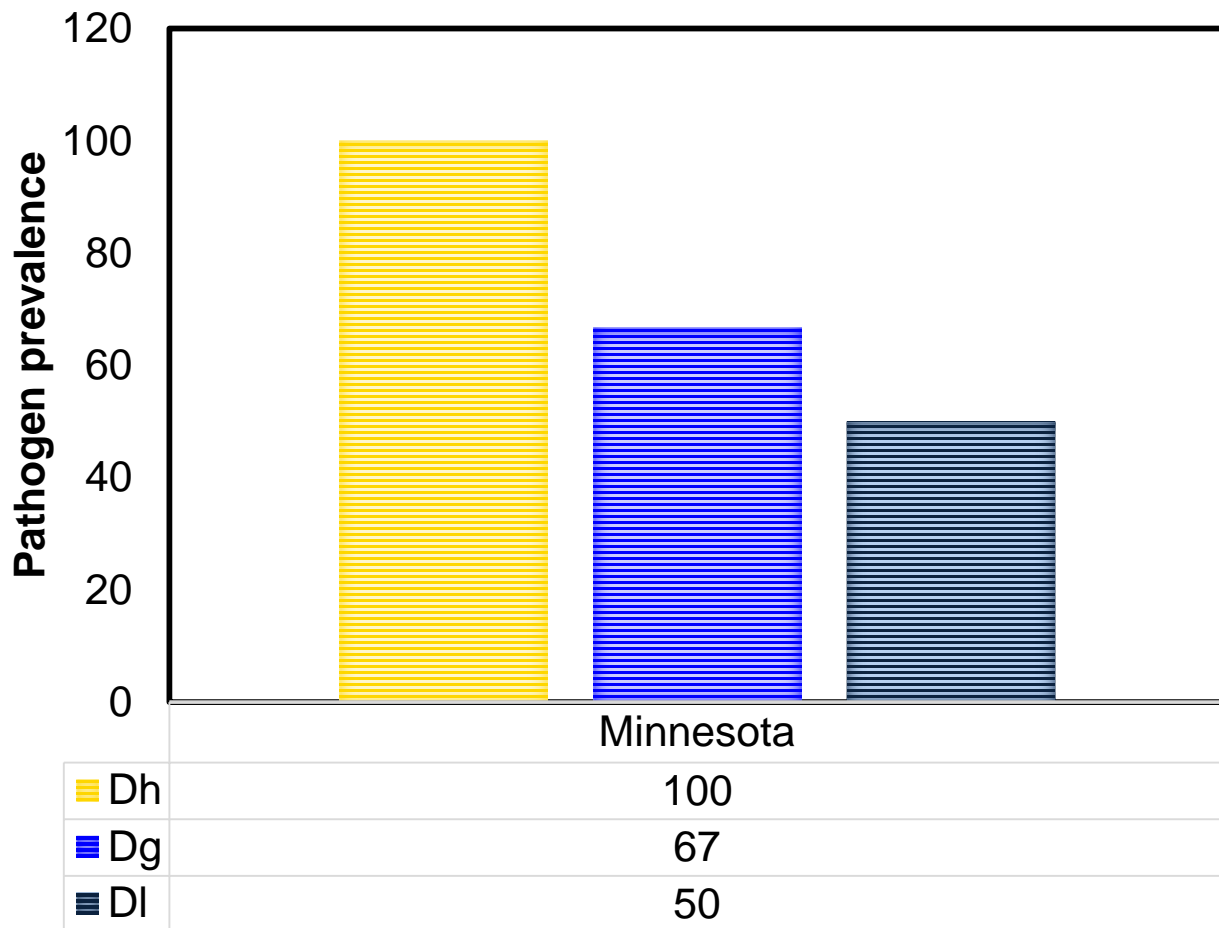
2019



% counties



2019



Minnesota counties:

Phomopsis helianthi –
Marshall, Mentor, Norman,
Polk, Red Lake, Ward

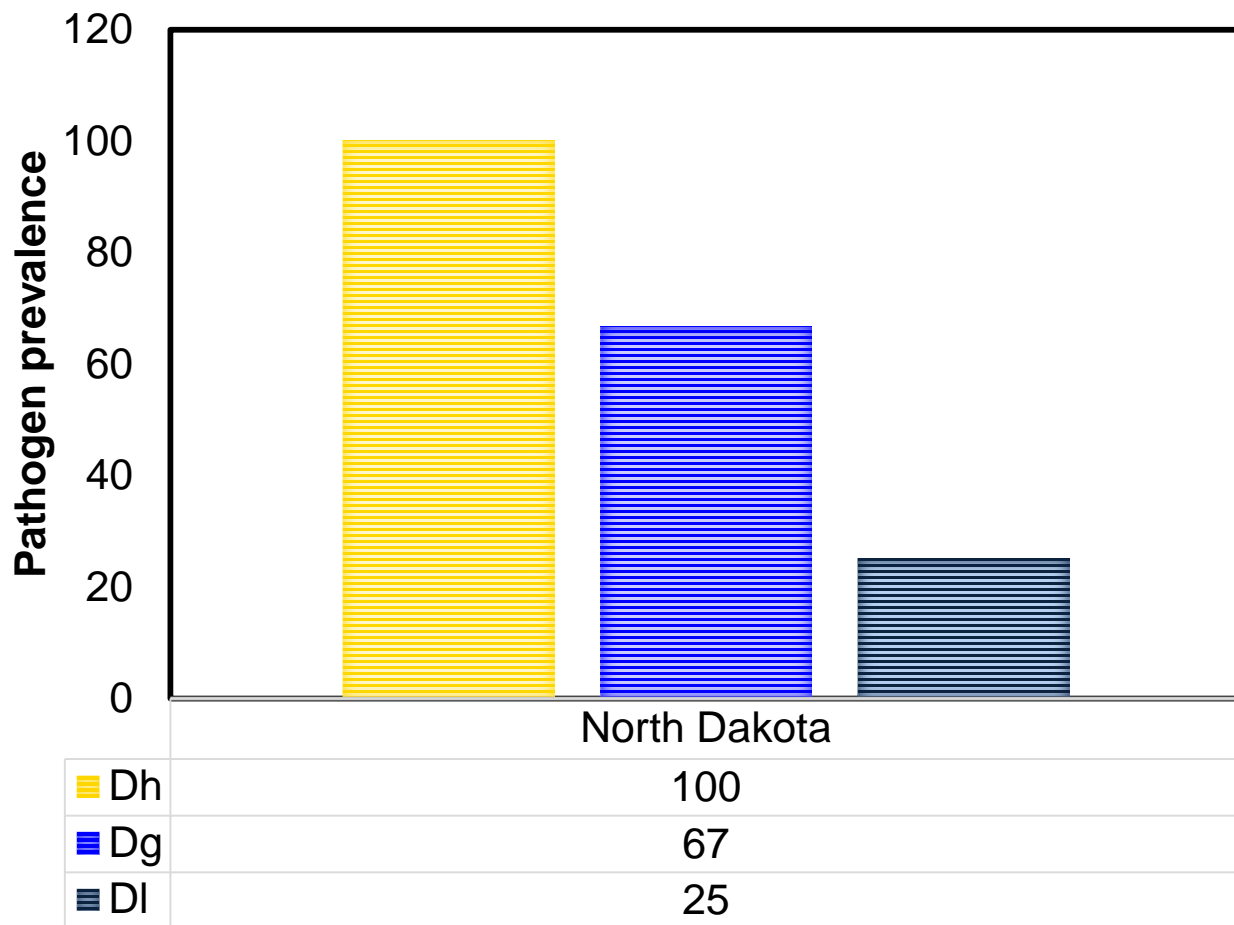
Phomopsis gulyae –
Mentor, Polk, Red Lake,
Ward

Phomopsis longicolla –
Marshall, Red Lake, Ward

% counties



2019



North Dakota counties:

Phomopsis helianthi – Adam, Bottineau, Burke, Divide, Emmons, Grand Forks, Logan, Mountrail, Pembina, Renville, Steele, Wells

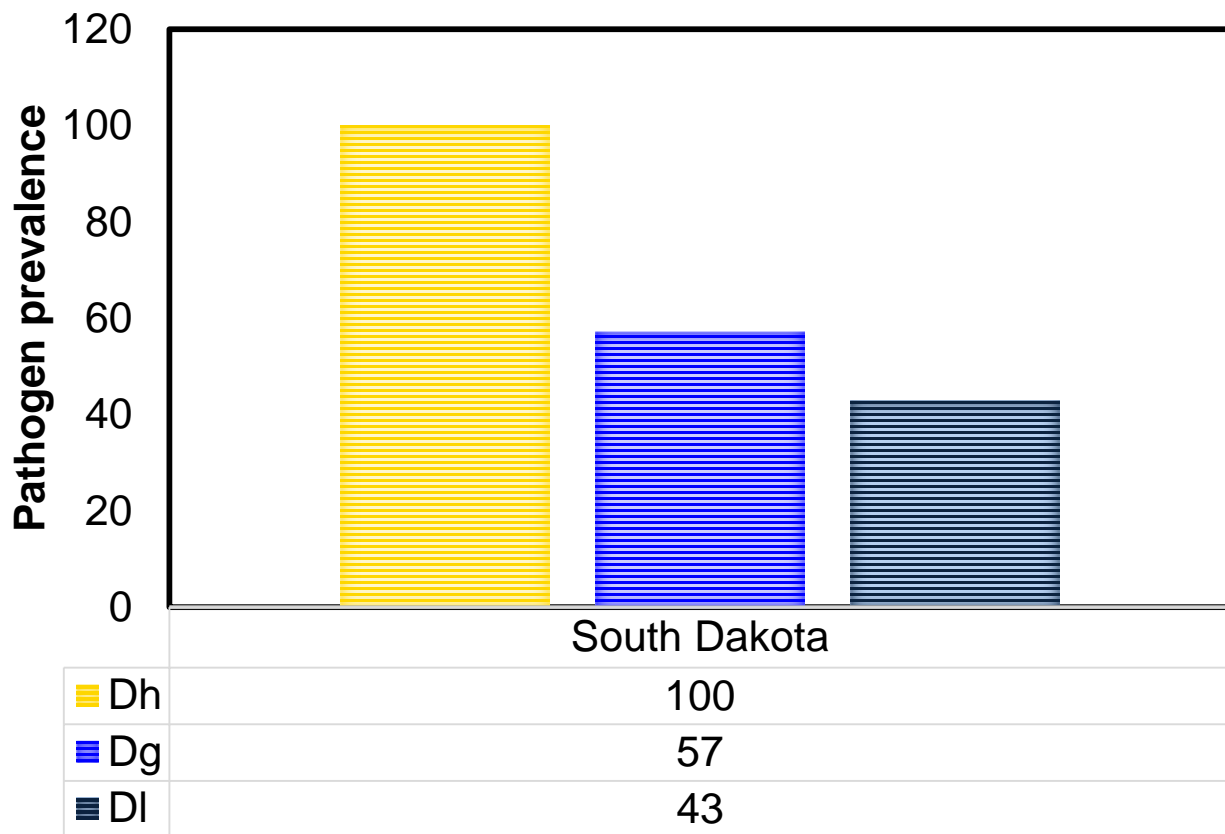
Phomopsis gulyae – Bottineau, Burke, Emmons, Divide, Mountrail, Pembina, Renville, Steele

Phomopsis longicolla – Burke, Pembina, Steele

% counties



2019



South Dakota counties:

Phomopsis helianthi – Bon Homme, Buffalo, Faulk, Hughes, Hyde, Stanley, Sully

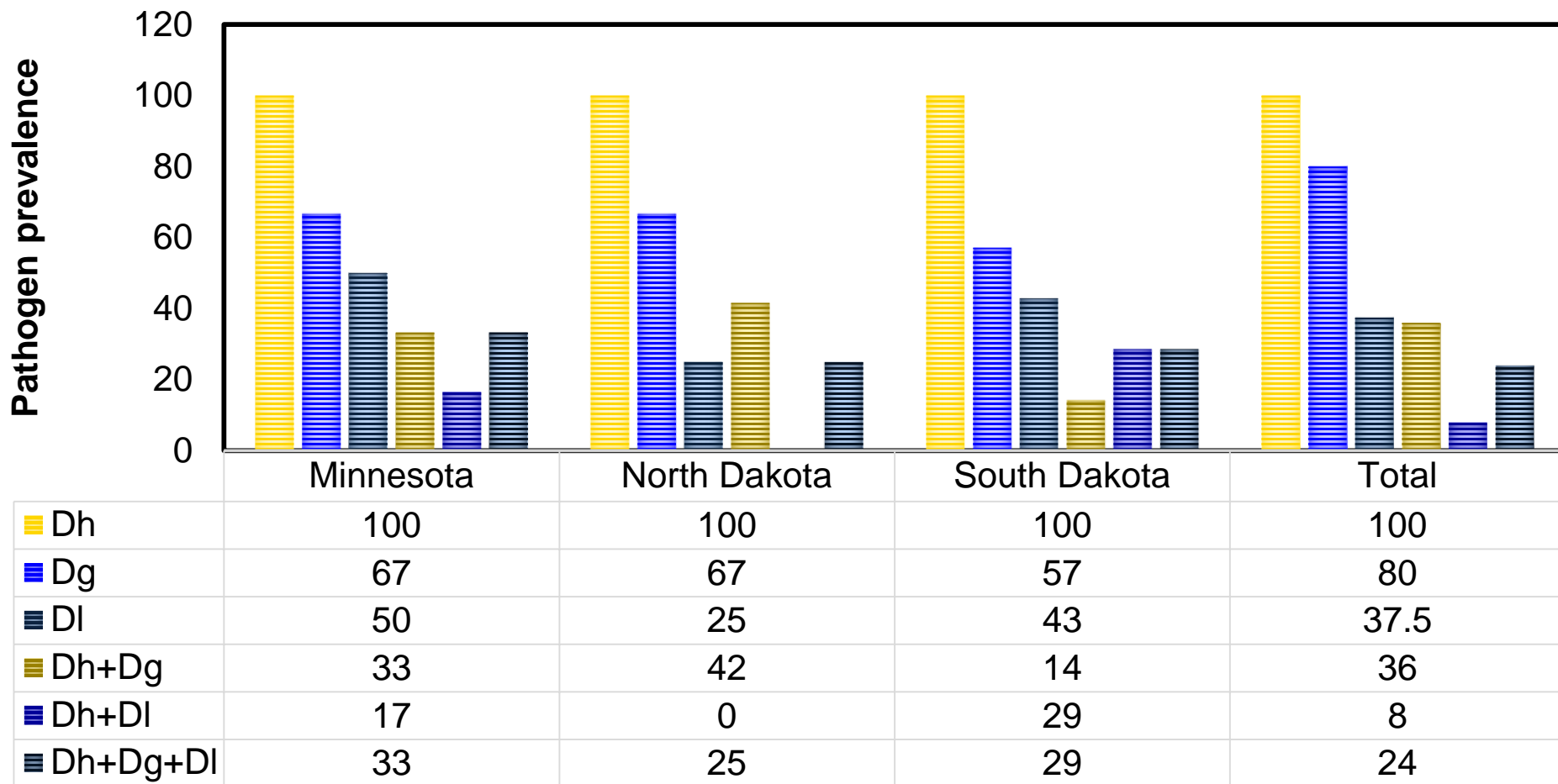
Phomopsis gulyae– Bon Homme, Hughes, Stanley, Sully

Phomopsis longicolla– Faulk, Hughes, Sully

% counties



2019

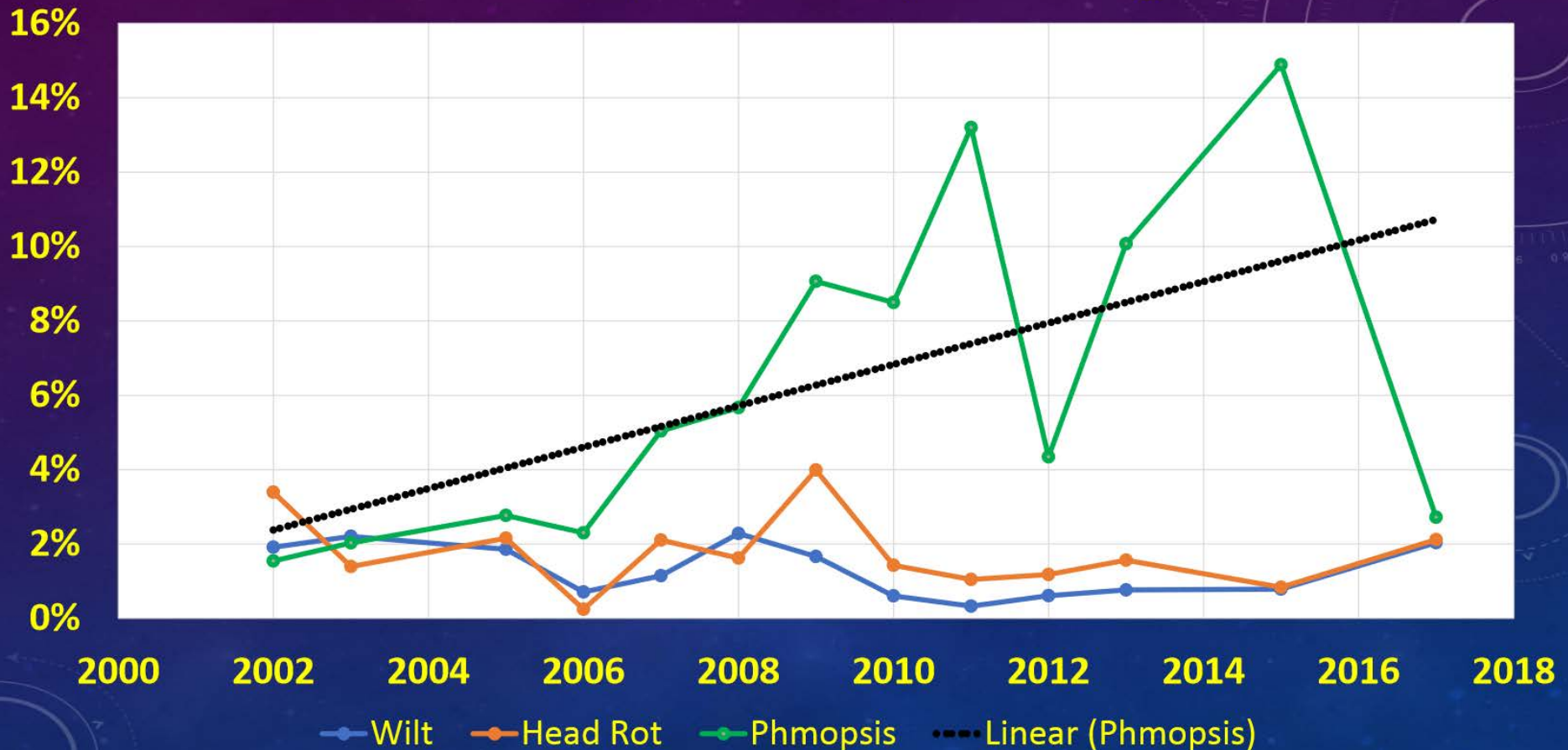


% counties



Summary

% U.S. Sunflower Crop Affected by Three Major Diseases



Gulya et al. 2019, Gulya and Mathew 2017





Courtesy: Ruth Beck

Summary

- Phomopsis stem canker continues to be of concern – four species identified as of 2020.
- Few species – *P. gulyae*, *P. longicolla* – possibly infects sunflower before we see symptoms (Dangal et al. 2020)



Summary

1:45 *Isolation and Pathogenicity of Phomopsis from Symptomless Sunflower*

- **Nabin Dangal**, Brian Kontz, Nathan Braun & Febina Mathew, SDSU, Dept. of Agronomy, Horticulture & Plant Science, Brookings, SD; Sam Markell, Brian Hansen & Jessica Halvorson, NDSU, Dept. of Plant Pathology, Fargo, ND; Bob Harveson, Clay Carlson & Tyler Patrick, University of Nebraska-Lincoln, Panhandle Research & Extension Center, Scottsbluff, NE



Solutions = Fungicides?

1:30 *Greenhouse Evaluation of Different Fungicides at Multiple Rates to Control Phomopsis helianthi*

- **Ruchika Sharma**, Nathan Braun & Febina Mathew, SDSU, Dept. of Agronomy, Horticulture & Plant Science, Brookings, SD; Sam Markell, NDSU, Dept. of Plant Pathology, Fargo, ND; Bob Harveson, University of Nebraska-Lincoln, Panhandle Res. & Ext. Center, Scottsbluff, NE

2:00 *Evaluation of Fungicides for Their Efficacy Against Phomopsis Stem Canker of Sunflower*

- **Renan Guidini**, Nathan Braun & Febina Mathew, SDSU, Dept. of Agronomy, Horticulture & Plant Science, Brookings, SD; Sam Markell, NDSU, Dept. of Plant Pathology, Fargo, ND; Bob Harveson, University of Nebraska-Lincoln, Panhandle Res. & Ext. Center, Scottsbluff, NE



Solutions = Genetics?

Poster session *Identification of common accessions resistant to Diaporthe gulyae at the vegetative and reproductive growth stages of sunflower*

- **Renan Guidini**, Nathan Braun & Febina Mathew, SDSU, Dept. of Agronomy, Horticulture & Plant Science, Brookings, SD



